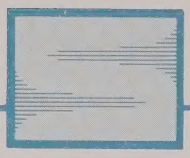

SPECTRACOM CORPORATION

ROCHESTER, NEW YORK • USA

VersaTap™
Model 8140VT

INSTRUCTION MANUAL

VersaTap™
Model 8140VT

INSTRUCTION MANUAL

Spectracom™ Corporation
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SPECIAL INSTALLATION INFORMATION

Remove power from the distribution amplifier when connecting VersaTap units to the system.

The 12-volt regulator (A4 U10) in the distribution amplifier may oscillate if multiple VersaTap units are added simultaneously while power is applied.

If removing power from the distribution amplifier is not possible, then the VersaTap units must be added one at a time.

If the voltage regulator does oscillate, then the LOCK lamp on the VersaTap will blink. To correct this condition, remove power from the distribution amplifier and then re-apply power. If the LOCK lamp continues to blink, measure the DC voltage on the trunk line (refer to Sections 3.0 and 4.0).

Distribution amplifiers with a voltage regulator in location A4 U10 labelled 78T12 or 78T15 do not exhibit this condition.

For a complete review of installation information, refer to Section 5.0 of this manual.

Spectracom Corporation
101 Despatch Drive
East Rochester, New York 14445

WARRANTY REGISTRATION

Dear Customer,

Spectracom occasionally contacts customers regarding our products. We must know to whom we should send manual updates, change notices, and new product information. Because people sometimes change job assignments, we request department, mail station, and title information to ensure that correspondence in future years will reach either the user of our products or his/her supervisor. In filling out the registration, please use the title/mail station/department of the supervisor most interested in keeping the equipment and its documentation up-to-date. Thank you.

- -

Name _____ Title _____

Department _____ Mail Stop _____

Company _____ Model Number _____

Address _____ Serial No. _____

City _____ Date Installed _____

State_____ Zip _____

Telephone_____ Ext. _____

Remarks (problems, suggestions, etc.): _____

_____

_____

_____

_____

Spectracom Corporation
101 Despatch Drive
East Rochester, NY 14445

WARRANTY

Spectracom Corporation warrants to the original purchaser each new instrument to be free from defects in material and workmanship for a period of one year after shipment. Repair or replacement, at our option, will be made when our examination indicates that defects are due to workmanship or materials. Batteries, fuses, and lamps that have given normal service are excluded from warranty coverage. All warranty returns must first be authorized in writing by the factory.

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This warranty is in lieu of all other obligations or liabilities expressed or implied and Spectracom Corporation neither assumes nor authorizes any person to assume for them, any other liability in connection with sales of its products.

REPAIR AND MAINTENANCE

Instruments should be returned only upon prior authorization from Spectracom Corporation or its authorized sales and service representative. Warranty repair will be made upon written request. Please provide the following information in order to enable us to serve you efficiently:

1. Model number and type
2. Serial number
3. Description of trouble
4. Conditions and hours of use

Upon receipt of this information our service department will send you service data or shipping instructions. Transportation to the factory is be prepaid by purchaser.

For assistance contact your nearest Spectracom sales representative or the factory.

1.0 INTRODUCTION

This manual contains information required to install, operate, test, adjust and service the Spectracom VersaTap™. The VersaTap™ is a special-frequency Line Tap in the Spectracom Frequency Distribution Amplifier System.

2.0 DESCRIPTION

The VersaTap contains a crystal oscillator that is phase locked to an incoming 10-MHz reference. The output frequency is that of the selected crystal or a frequency that is derived by dividing the crystal frequency by a fixed integer between 1 and 8,192. The crystal frequency is between 4 MHz and 20 MHz.

There are two output BNC connectors. Between 500 Hz and 100 kHz Output A is a 50-ohm TTL source. It is a 50-ohm sine wave source between 100 kHz to 20.0 MHz.

Output B is a 50-ohm TTL source. The frequency of Output B is the same as the frequency of Output A.

Optionally, a LOCK/UNLOCK signal can be provided on Output B. The option is selected by moving an internal jumper.

A LED indicator labelled, LOCK, will light when the crystal oscillator is phase locked to the incoming reference. The indicator blinks if the input DC voltage is less than 8 VDC.

The 10-MHz reference may originate from any of the Spectracom units listed below:

Model 8130	Frequency Standard Oscillator with Option 03 Built-in Distribution Amplifier.
Model 8140	Frequency Distribution Amplifier with separate 10-MHz frequency source.
Model 8161	WWVB Receiver/Frequency Standard with Option 03 Built-in Distribution Amplifier.
Model 8164	Ageless™ Disciplined Oscillator with Option 03 Built-in Distribution Amplifier.

3.0 SPECIFICATIONS

INPUT:

10.0 MHz with signal level between 100 millivolts and 5.5 volts peak-to-peak on a DC voltage of 8 to 12 VDC. The DC current requirement is 165 milliamps at +12 VDC with a 50 ohm load on Output A and Output B.

Option 45, RS-422 output, requires 260 milliamps at 12 VDC with all outputs properly terminated.

OUTPUT A:

A sine wave of 1.7 volts peak-to-peak at the specified frequency into a 50-ohm load for frequencies greater than 100 kHz. A TTL output for frequencies below 100 kHz with a source impedance of 50 ohms (SN74S140 driver).

OUTPUT B:

A TTL output at the specified frequency with a source impedance of 50 ohms (SN74S140 driver). If the internal jumper, W6, is moved to location W5, Output B is HIGH when the VersaTap is phase locked to the incoming reference and LOW when it is unlocked.

LOCK LED:

The LED will light when the VersaTap is locked to the incoming reference. The LED will blink if the DC input is low, which may cause the VersaTap to malfunction. The LED will be unlit when the VersaTap is not locked to the incoming reference.

PHYSICAL:

Width	4 1/4 inches
Length	9 1/2 inches
Depth	1 3/4 inches
Weight	2 pounds

LABEL:

Serial number tag lists unit serial number and output frequency.

4.0 TYPICAL SYSTEM CONFIGURATION

A typical configuration is illustrated in Figure 4-1.

A standard frequency of 1, 5, or 10 MHz, is provided to the Model 8140. The Model 8140 sends out a 10-MHz standard frequency, riding on +12 VDC from four output ports. Line Taps or VersaTaps are located at remote locations.

The Model 8130 with Option 03, Built-in Distribution Amplifier, can replace the Model 8140 Frequency Distribution Amplifier.

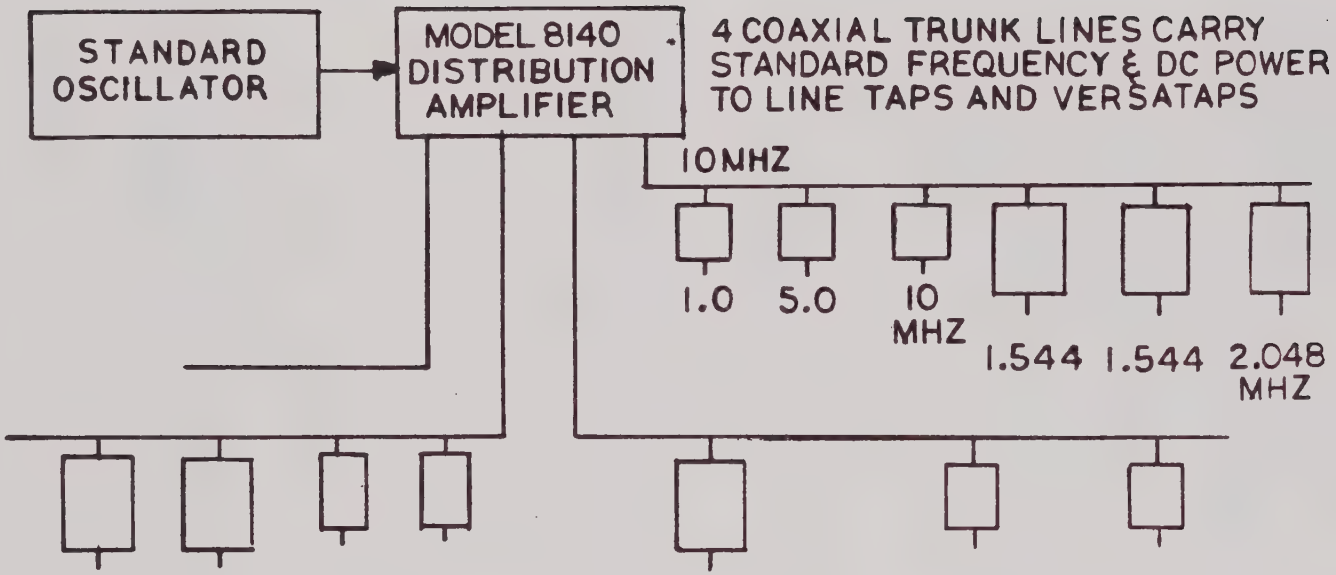


Figure 4-1 Frequency Distribution System

For applications where frequent calibration of the standard oscillator is undesirable, the Model 8164 Ageless Oscillator with Option 03 Built-in Distribution Amplifier is recommended. The Model 8164 receives the signal from the National Bureau of Standards WWVB radio station and continuously calibrates its precise internal quartz oscillator. The 10-MHz standard frequency is added to +12 VDC and distributed from four output BNC connectors.

The Model 8161 WWVB Receiver/Frequency Standard is the same as the Model 8164 except that an operator manually calibrates the internal oscillator against the received standard.

Using RG-58/U coaxial cable, one VersaTap may be located a maximum distance of 1500 feet from the distribution amplifier. This is limited by the attenuation characteristics of the cable (1.4 dB per 100 feet). For applications longer than 1500 feet, larger cable such as the RG-8 or a Model 8140TA Distribution Line Amplifier may be used.

The maximum number of Line Taps and VersaTaps that may be used with a distribution amplifier is limited by the capacity of the power supply. A distribution amplifier will drive 25 standard Line Tap loads. The maximum number of standard VersaTaps on a distribution amplifier is 8. The maximum number of VersaTaps with Option 45 on a distribution amplifier is 5.

The average distance that taps can be located from a distribution amplifier is limited by the voltage drop in the coaxial cable. Eight standard VersaTaps may be located an average distance of 200 feet from a distribution amplifier. Five VersaTaps with Option 45, RS-422 output, may be located an average distance of 250 feet from a distribution amplifier. Additional VersaTaps may be added by using Option 40, External DC Input.

5.0 INSTALLATION

It is recommended that the VersaTap be mounted to a lab bench or nearby wall, using the four mounting holes on the base.

A BNC tee connector is provided on the INPUT connector. Connect a RG-58/U coaxial cable from the distribution amplifier to the tee connector. Connect a second RG-58/U cable from the other side of the tee connector and continue on to the next unit. TERMINATE THE LAST UNIT WITH A 50-OHM DC ISOLATED TERMINATOR.

Terminators are furnished with the base unit, i.e. Models 8130, 8140, 8161, or 8164. Additional terminators may be ordered from Spectracom. The terminator part number is 004490.

After the VersaTap is connected to a 10.0-MHz reference, the LOCK lamp will light. This takes less than 30 seconds.

If the LOCK lamp does not light, refer to Section 8, Performance Tests.

6.0 INTERNAL JUMPERS

There are two internal jumpers:

Jumper W9/W10 — The normal operating position is W9. During calibration, the jumper is moved from location W9 to location W10.

Jumper W5/W6 — The jumper is normally located in position W6. Output B then provides a TTL output signal of the same frequency as Output A. If the jumper is moved to location W5 then Output B provides a LOCK/UNLOCK TTL level signal.

7.0 ADJUSTMENTS

7.1 CRYSTAL OSCILLATOR ADJUSTMENT

As the crystal ages, the control voltage to the VCXO will change to compensate for the aging process. To calibrate the VCXO, move the W9 jumper to location W10. Connect a counter to U16 PIN 12. Adjust trimmer capacitor C36 until the counter reads the frequency of the crystal ±10 Hz. Return the jumper from W10 to location W9.

7.2 LOCK DETECTOR LEVEL ADJUSTMENT

RKW

Adjust potentiometer R16 for 4.35 ±0.05 volts DC at U8 pin 13.

8.0 PERFORMANCE TESTS

The performance tests given in this manual are suitable for incoming inspection, trouble shooting or preventative maintenance. The tests are designed to verify the specifications. Perform the tests in the order given.

8.1 TEST EQUIPMENT

TABLE 8-1, RECOMMENDED VERSATAP TEST EQUIPMENT

EQUIPMENT	RECOMMENDED MODEL
Signal Generator	Marconi 2022
DC Power Supply Variable 0 to 12 volts	Kikusui Model PWC 0620
Oscilloscope	Tektronix Model 455 or Model 2215
Multimeter	Fluke 75
50-Ohm Terminator	
100-uh Choke	
0.1-uf Capacitor	

8.2 TEST SET-UP

Figure 8-1 shows the test configuration.

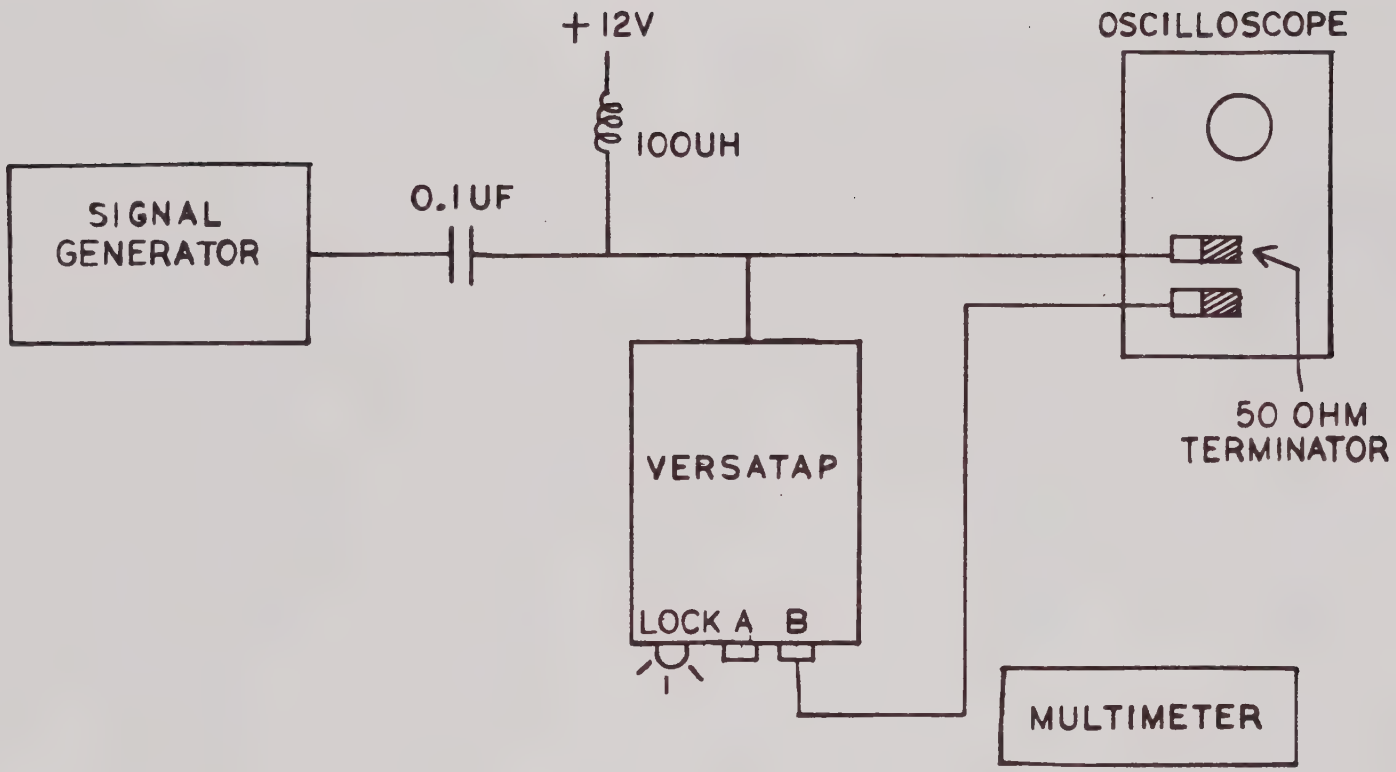


Figure 8-1 VersaTap™ Test Set-Up

8.3 TEST PROCEDURES

8.3.1 TEST 1 - DC VOLTAGES

Measure the supply voltages at the following locations:

U3 pin 3	+5 volts (±0.25)	_____ volts
U8 pin 4	+12 volts (±0.5)	_____ volts

8.3.2 TEST 2 - VCXO ALIGNMENT

Move jumper W9 to location W10. Measure the signal at U16 pin 12 with the oscilloscope.

U16 pin 12	LOW (<1.0 V)	_____ volts
U16 pin 12	HIGH (>4.0 V)	_____ volts

Connect a counter to U16 pin 12 and adjust trimmer C36 to the desired frequency.

Crystal Oscillator Frequency (±10 Hz) _____ Hz

Move jumper from location W10 back to W9.

8.3.3 TEST 3 - LOCK THRESHOLD

Measure the DC voltage at U8 pin 2. Adjust R16 so the voltage is 4.35 ±0.05 volts.

U8 pin 2 Threshold Voltage (4.35 ±0.05 volts) _____ volts)

8.3.4 TEST 4 - INPUT SENSITIVITY

Adjust the output of the signal generator so the input signal is 10.0 MHz, 100 mV p-p.

The LOCK lamp will light.

LOCK LAMP _____

8.3.5 TEST 5 - OUTPUT LEVELS

Terminate Output A in 50 ohms. Output A is a sine wave whose amplitude is nominally 1.7 V p-p for frequencies from 100 kHz to 20 MHz. For frequencies below 100 kHz the output is a TTL signal.

Output A	(1.7 V p-p)	_____ V p-p
Output A, TTL LOW	(<0.8 V)	_____ volts
Output A, TTL HIGH	(>2.0 V)	_____ volts

Terminate Output B in 50 ohms. The output is a TTL signal.

Output B, TTL LOW	(<0.8 V)	_____ volts
Output B, TTL HIGH	(>2.0 V)	_____ volts

9.0 PRINCIPLES OF OPERATION

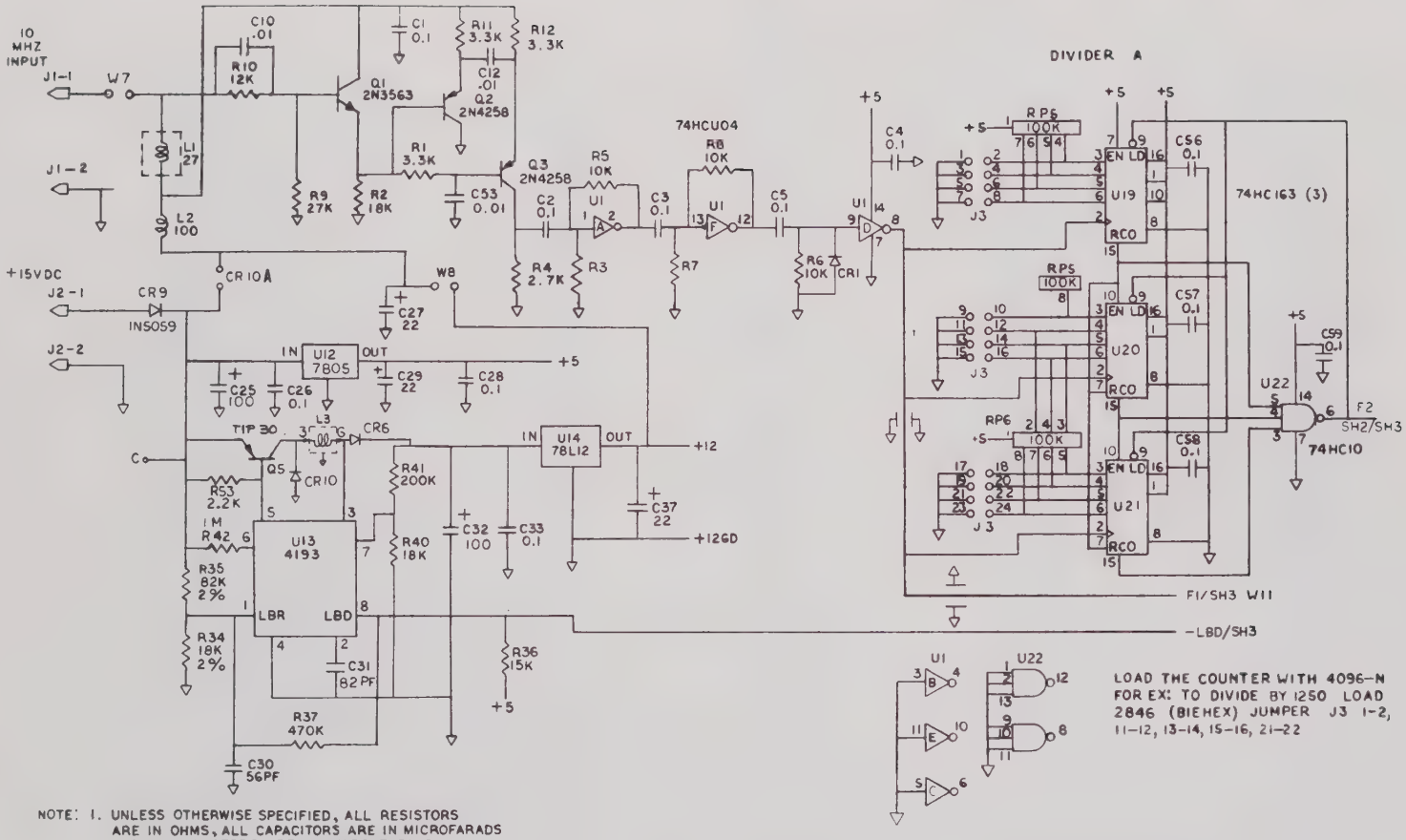
The VersaTap schematics are shown in Figure 9-1, Sheets 1 through 3. Figure 9-2 shows VersaTap component locations.

9.1 INPUT SECTION

Figure 9-1, Sheet 1 is the input section. The 10-MHz input reference is provided to J1 pin 1 and amplified by Q1, Q2, and Q3. The signal from Q3 is amplified to CMOS level by amplifier U1.

The signal from U1 pin 8 is provided to DIVIDER A which comprises U19, U20, and U21.

A 12 bit synchronous binary counter (U19, U20 and U21) divides the input reference. The divide ratio is selected by jumpers in J3. The counters count up to the maximum count and are loaded to a count determined by the jumpers. To divide by N the counters are loaded to 4096-N. For example, to divide by 1250, the counter would be loaded with 4096-1250 or 2846 (BIE Hex). The least significant bit is J3 1-2, the most significant bit is J3 23-24. Pull up resistors are provided on the load inputs for U19, U20 and U21. The jumper configuration for loading 2846 (BIE Hex) is J3 1-2, 11-12, 13-14, 15-16, 21-22.



NOTE: 1. UNLESS OTHERWISE SPECIFIED, ALL RESISTORS ARE IN OHMS, ALL CAPACITORS ARE IN MICROFARADS AND ALL INDUCTORS ARE IN MICROHENRIES.
2. UNLESS OTHERWISE SPECIFIED, ALL DIODES ARE IN4148.

Figure 9-1 VersaTap™ Schematic, Sheet 1 of 3

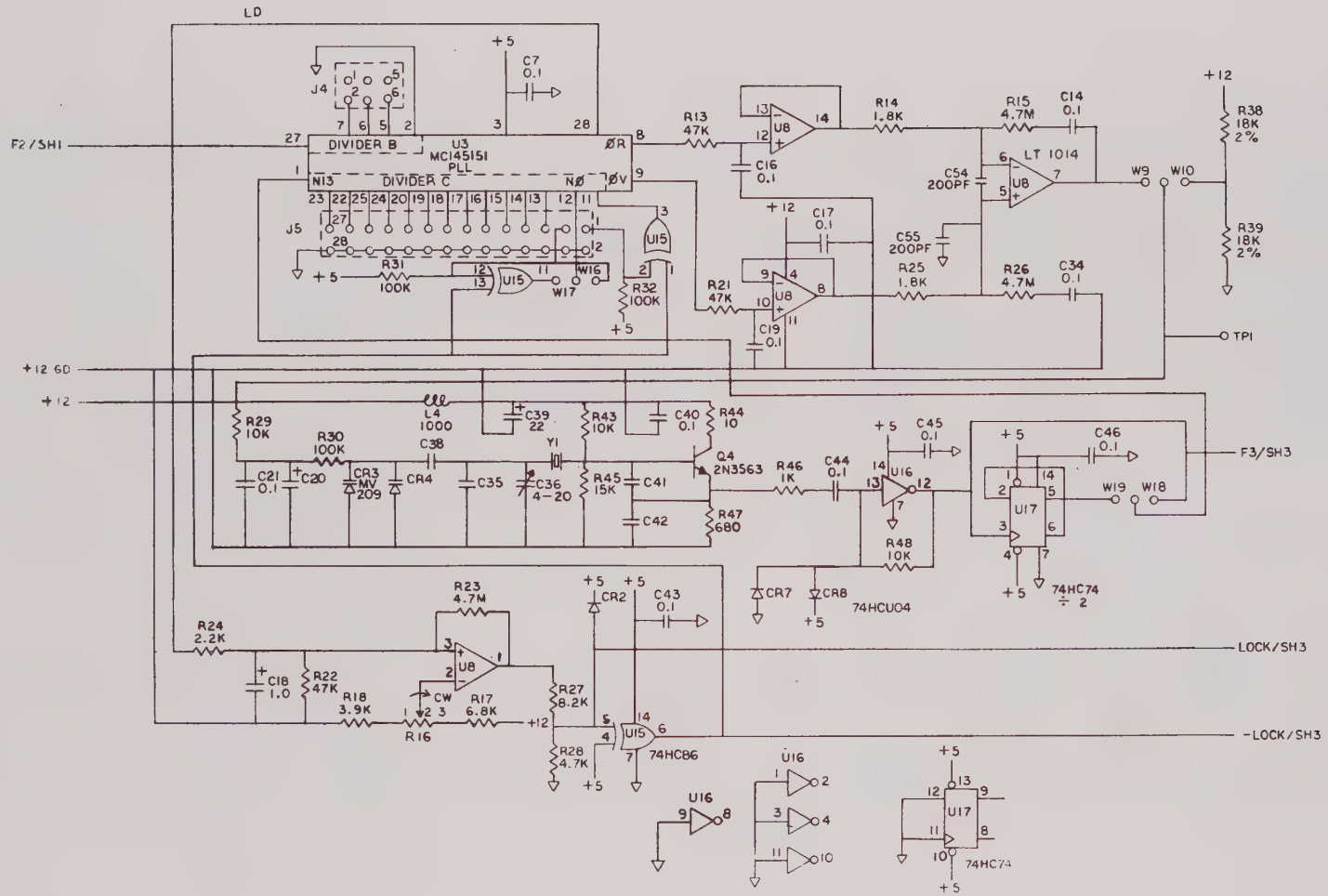


Figure 9-1 VersaTap™ Schematic 2 of 3

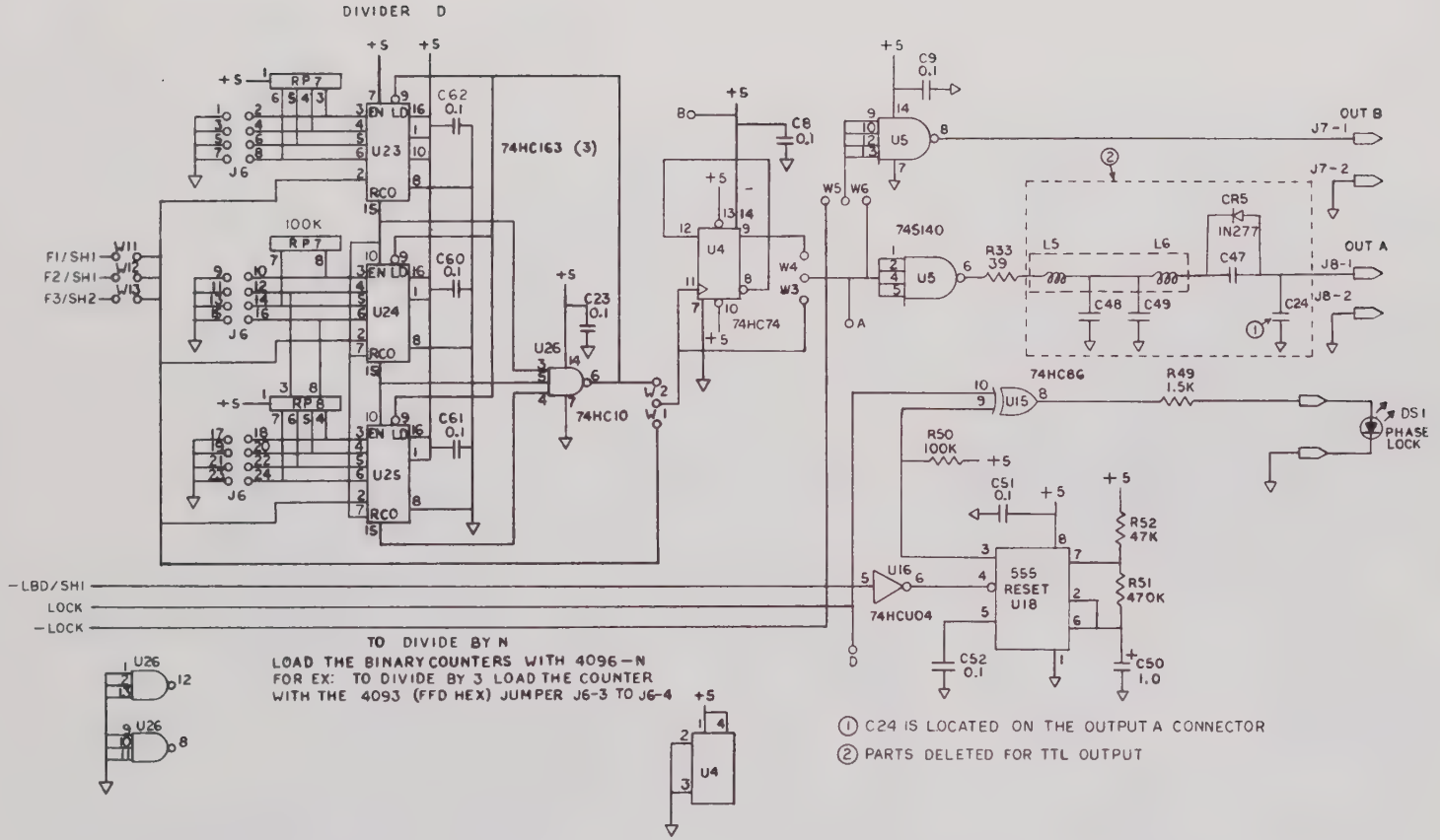


Figure 9-1 VersaTap™ Schematic Sheet 3 of 3

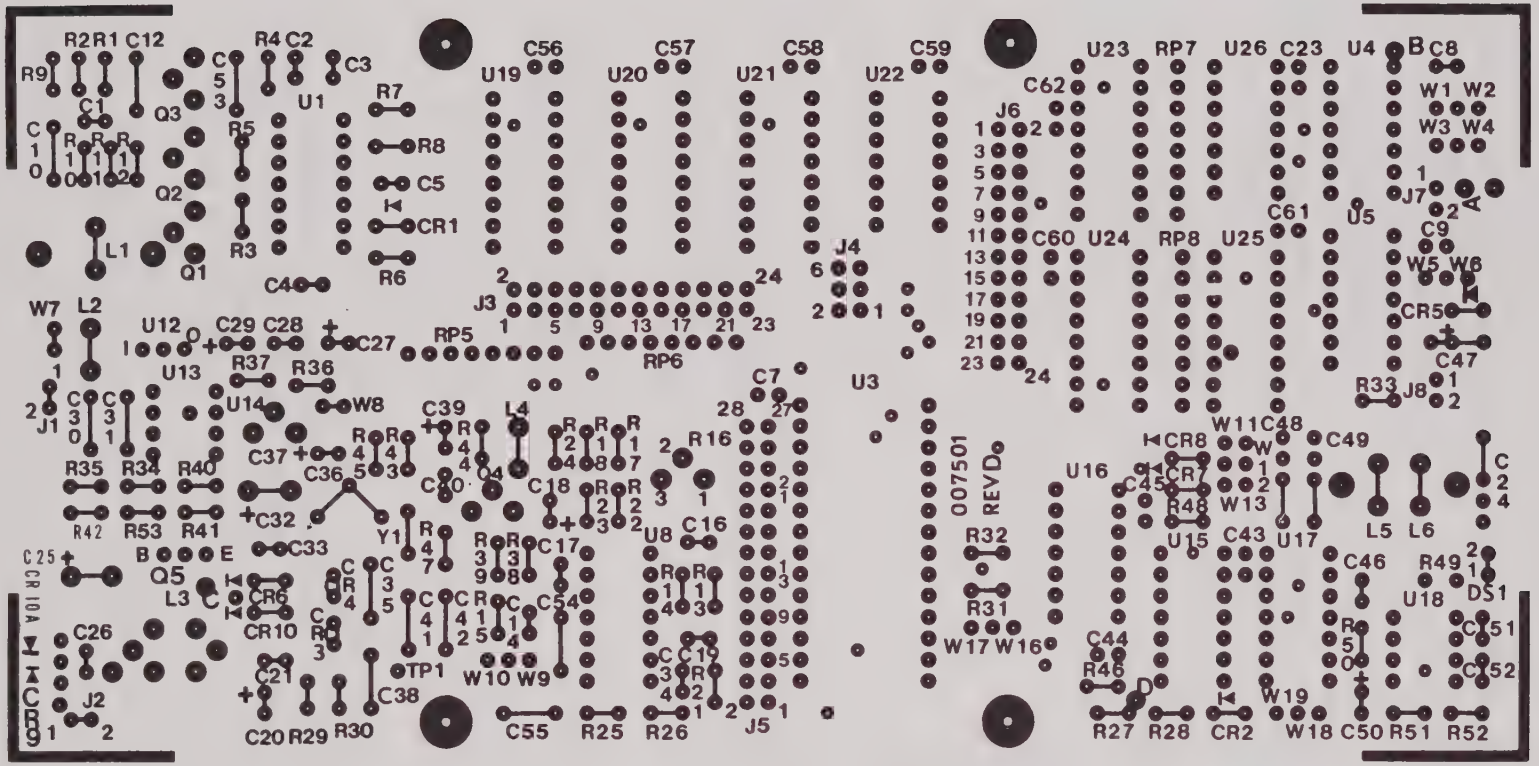


Figure 9-2 VersaTap™ Assembly

9.2 PHASE COMPARATOR, VCXO AND LOCK DETECTOR

Figure 9-2, Sheet 2 shows the phase comparator (U3) and voltage controlled crystal oscillator. The input signal F1 from Sheet 1 is provided to U3 pin 27. This signal is divided down to the phase comparison frequency which is usually 1000 Hz. The divide number is selected by jumper J4. Table 9-1 lists the divide ratio for each of the eight possible jumper connections.

TABLE 9-1, DIVIDER B

J4-5 to J4-6	J4-3 to J4-4	J4-1 to J4-2	Divide Ratio
IN	IN	IN	8
IN	IN	OUT	128
IN	OUT	IN	256
IN	OUT	OUT	512
OUT	IN	IN	1024
OUT	IN	OUT	2048
OUT	OUT	IN	2410
OUT	OUT	OUT	8192

The output from the crystal oscillator is amplified by U16A. For frequencies above 15.0 MHz, the oscillator output is divided by 2 by U17A and then provided to pin 1 of U3. For crystal oscillator frequencies below 15.0 MHz, the output from U16A is provided directly to U3 pin 1.

The internal divider of U3 is a down counter programmed by inputs N0 through N13. These inputs provide the data that is preset into the counter when it reaches zero. N0 is the least significant bit, N13 is the most significant bit.

To program a zero a jumper is added. If the input is left open then a logical one is programmed.

The output from the phase comparator section of U3 is $\emptyset_V$ and $\emptyset_R$.

If the crystal oscillator is high in frequency then error information is provided by $\emptyset_V$ pulsing low, $\emptyset_R$ remains high. If the crystal oscillator is low in frequency the $\emptyset_R$ pulses low and $\emptyset_V$ remains high. The outputs $\emptyset_V$ and $\emptyset_R$ are provided to low pass filters and the loop filter U8B.

The error voltage from U8 pin 7 is applied to the VCXO. The VCXO is a Colpitts oscillator with varicap control.

The loop lock indication, LD, is brought out on pin 28 of U3. It is a high level when the loop is in lock and pulses low when the loop is out of lock. This signal is filtered and fed into U8. The lock level threshold is adjusted by potentiometer R16.

The output from U15 pin 6, -LOCK, is fed to jumper W5 located on Sheet 3. If jumper W5 is in, then this signal is fed to Output B. This provides an external LOCK signal for remote sensing.

The LOCK signal from U15 pin 4 is provided to U15 pin 10 which drives the LOCK lamp.

Referring to Sheet 3: U18 is a low frequency oscillator (1.3 Hz) whose output, U18 pin 3 is provided to the exclusive OR GATE U15, PIN 9. If the oscillator is reset by the signal from U16 pin 6 then its output is low and the exclusive OR GATE does not invert the LOCK signal at pin 10 of U15. If the reset signal at pin 4 of U18 is high then the output signal U18 pin 3 will go high and low and cause the lock lamp to blink.

The reset signal for U18 originates on Sheet 1 U13 pin 8. If the input DC voltage is below 7 volts then U18 pin 8 will go low. This action releases the reset on U18 pin 4 and causes the LOCK lamp to blink.

9.3 OUTPUT DIVIDER

Referring to Sheet 3: U23, U24 and U25 are the binary counters of the output divider (Divider D). The input signal enters through W11, W12 or W13. It may be jumpered directly to the output via W1 and W3 or it may be divided by two and coupled to the output if jumpers W1 and W4 are installed. Refer to Section 9.1, Input Section, for a description of the counter logic.

The output from the binary divider is fed to W2. If W3 is installed it is provided directly to the output. If W4 is installed it is divided by two and provided to the output.

The signal from U5 is filtered and provided to Output A. For frequencies below 100 kHz the filter is not present and the TTL signal from U5 pin 6 is provided to Output A.

The signal from U5 pin 8 is a TTL signal that drives Output B. The source of the signal is from W5 or W6. If W5 is installed the output is the LOCK/UNLOCK signal. If W6 is installed the output is the frequency specified on the serial number tag. Units are shipped with jumper W6 installed.

9.4 POWER SUPPLY

The power supply is shown in Figure 9-1, Sheet 1. The input signal from J1-1 is provided through L1, L2 and W14 to the +5 volt linear voltage regulator. Inductors L1 and L2 are high impedances to the 10-MHz input reference and low impedance to the 12-VDC component.

The input DC voltage is coupled to U13, a switching voltage regulator. The output is +15 VDC. This signal is regulated down to +12 VDC. The +12 VDC is used by the crystal oscillator and loop amplifier, U8.

Input U13-1 measures the DC voltages from J1-1. If the input DC voltage drops below 8 volts then U13-8 low battery detector, LBD, will go low. The signal is provided to U18-4 on Sheet 3 and will cause the LOCK lamp to blink.

SECTION 10 - VERSATAP OPTIONS

10.0 OPTIONS

10.1 Option 40 - External DC Input

This option makes it possible to use the VersaTap with any reference frequency or Spectracom products not equipped with Option 03, the Built-In Distribution Amplifier. The external DC input option may also be used to increase the number of VersaTaps allowed per distribution amplifier. Power supply limitations of the distribution amplifier permit a maximum of eight standard VersaTaps, and five Option 45 equipped VersaTaps. Units added above the maximum allotted number must be equipped with Option 40, External DC Input. Option 40 AC couples the input circuitry and therefore draws a negligible amount of current from the distribution line. The external DC power is supplied from a 9 volt AC adapter. The DC power jack is located on the input side of the VersaTap.

The VersaTap is modified for external DC input with only minor component changes. Refer to Figure 9-1, VersaTap Schematic, Sheet 1 of 3 on page 10. Jumper W7 is removed and is replaced with a decoupling capacitor. Remove the jumper in location CR10A and leave open. Finally, add a jumper to short location W8. Location J2-1 is the external DC input.

CAUTION: A modified Radio Shack AC adapter, Cat. No. 273-1455, is the supplied power source. The cord has been spliced and reversed at the transformer end. The polarity of the plug has been changed such that the barrel is negative and the tip is positive.

Should it become necessary to replace the adapter, use the following guidelines in selecting a replacement:

Output Voltage	-	9-12 VDC
Minimum Output Current	-	300 mA
Connector	-	Coaxial "Barrel-Type" Plug
Polarity	-	Barrel - Negative Tip - Positive
Size	-	5.5 mm O.D., 2.1 mm I.D.

10.2 Option 45, RS-422 Output

Option 45 outputs the selected VersaTap frequency and lock status signals in EIA RS-422 signal levels. An external DC input and a TTL compatible signal of the selected frequency are also provided.

Option 45 replaces the output "B" BNC style connector with a 9 pin series D receptacle. Fig. 10.2.1 shows the pin locations as viewed from the output side of the VersaTap.

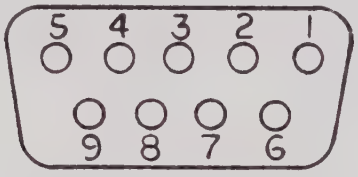


Figure 10.2.1 Option 45 Output B Connector

Signal	Mnemonic	Connector Pin
Output Frequency	+Fout	Pin 1
Output Frequency	-Fout	Pin 2
Lock Status	+Lock	Pin 5
Lock Status	-Lock	Pin 4
TTL Output	TTL OUT	Pin 9
External DC Input	Ext DC IN	Pin 8
Ground	GND	Pins 3,6,7

Fout and Lock signals conform to the EIA RS-422 standard. Up to 32 receivers may be employed at distances up to 4000 feet.

The +Fout signal is a positive going waveform, relative to -Fout, at the selected VersaTap output frequency.

The +Lock signal is high relative to -Lock when the VersaTap is locked to the incoming reference. If the unit is not phase locked, the +Lock signal will be low relative to -Lock.

Twisted pair cable should be used for each of the RS-422 signals. The source impedance for the Lock and Fout signals is 120 ohms. Terminate the lines with 120 ohms across each twisted pair at the last RS-422 receiver.

Option 45 provides a TTL compatible square wave at the specified frequency output. The TTL signal has a source impedance of 50 ohms (74S140).

The external DC input provides power to the VersaTap when using an existing reference frequency or Spectracom product not equipped with the Built-In Distribution Amplifier, Option 03. The external DC input may also be used to increase the number of VersaTaps allowed on a distribution amplifier. A distribution amplifier is capable of driving a maximum of five VersaTaps with the RS-422 Output option. Additional units must be powered by an external DC supply.

Option 40 provides external DC input via an AC adapter. Refer to Section 10.1 for a more complete discussion of Option 40.

Option 45 has a provision for customer supplied DC input. The external power supply must be capable of supplying 9 to 12 VDC at a minimum of 300 ma. Unless otherwise specified, units equipped with Option 45 will be powered from the distribution line. The VersaTap may be modified for external DC input with only minor component changes. Refer to Figure 9-1, VersaTap Schematic, Sheet 1 of 3 on page 10. Jumper W7 is removed and replaced with a decoupling capacitor. Remove the jumper in location CR10A and leave open. Finally, add a jumper to short location W8. The external DC is brought into the unit through the output "B" connector pin 8. Pins 3, 6 or 7 may be used as the ground return.

The schematic for Option 45 is shown in Figure 10.2.3. The assembly drawing is Figure 10.2.2.

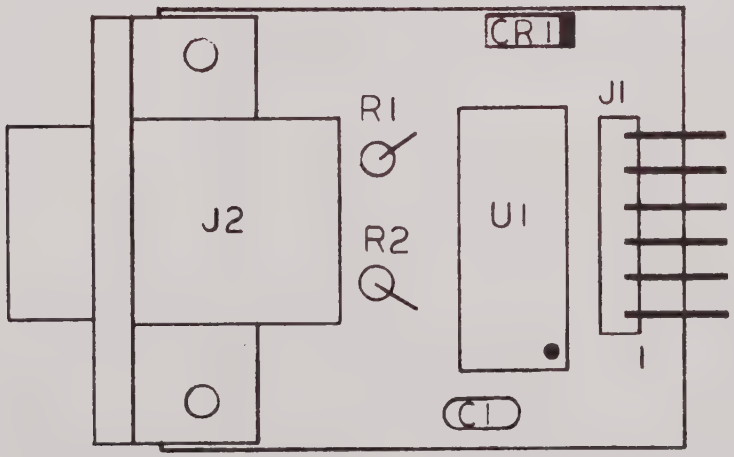


Figure 10.2.2 RS-422 Output Assembly

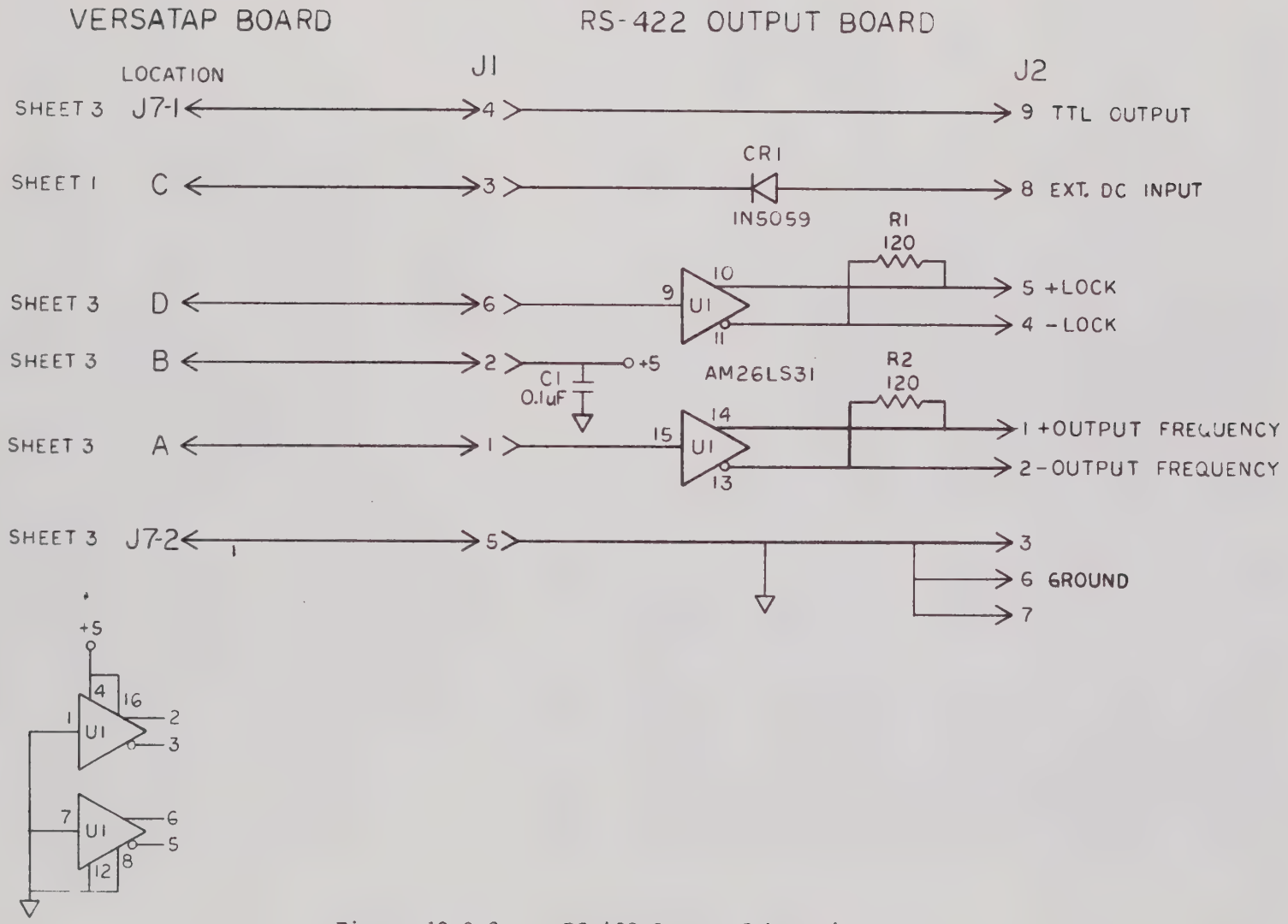


Figure 10.2.3 RS-422 Output Schematic

10.3 Option 46 - T1 Clock Extractor (includes Option 40, External DC Input)

Allows the VersaTap™ to extract and de-jitter the T1 clock frequency from a DS1 data stream. The partially de-jittered 1.544 MHz clock is furnished at the B OUTPUT. The A OUTPUT is fully de-jittered by the phase locked loop of the VersaTap, and converted to a frequency specified at the time of purchase. The signal input jack for this option accepts a standard type "310" cord.

Power is supplied to the VersaTap by an external plug-in line voltage converter that is supplied with Option 46.

The LOCK lamp on the VersaTap is on when the A OUTPUT is phase locked to the DS1 reference. If the DS1 reference has too much jitter, the loop will become unlocked. This will be indicated by the LOCK lamp flickering or the LOCK lamp will be OFF.

Specifications

Input: Stratum 1 or 2 DS1 signal from a DSX-1 cross-connect or D4 monitor jack.
Level 0.8 to 3.6 volts.
Input impedance 100 ohms.
Input jack accepts 310 plug.

Output A: A sinewave of typically 1.7 volts peak-to-peak at the specified frequency into a 50-ohm load for frequencies greater than 100 kHz. A TTL output for frequencies below 100 kHz with a source impedance of 50 ohms (SN74S140 driver).

Output B: The 1.544 MHz DS1 extracted clock. A TTL level 50 ohm source impedance (SN74S140 driver).

10.4 OPTION 48 - FRAMED ALL ONES OUTPUT (INCLUDES OPTION 40, EXTERNAL DC INPUT.

Option 48 provides a T1 "Framed All Ones" and a 1.544 MHz sinewave output phase locked to the 10 MHz reference input. Units with Option 48 may be operated from a Spectracom product with a built-in distribution amplifier (Option 03), or any 10 MHz reference when using the supplied AC adapter for power. On heaviy loaded distribution lines the AC adapter may be used to prevent overloading the power supply of the distribution amplifier. Each Option 48 VersaTap™™ consumes 200 mA.

Specifications

Input:

10.0 MHz with a signal level between 100 millivolts and 5.5 volts peak-to-peak. The VersaTap™ is powered either from the distribution line or the supplied AC adapter.

Output A:

1.544 MHz sinewave of 1.7 volts peak-to-peak into a 50 ohm load BNC connector.

Output B:

A T1 "Framed All Ones" whose output pulse characteristics conform to AT&T Compatibility Bulletin No 119, Table 3, Figure 3, into a 100 ohm resistive load. The Output B Jack accepts a 310 type plug. Framing is user selectable either D4 or extended superframe format (ESF). Units are set at the factory to type D4 framing (193S). To change to ESF (193E), remove the cover and move the shorting plug located on the top mounted board to the 193E position.

SECTION 11 - PARTS LIST

REF.DESIG	PART NO.	DESCRIPTION
C1-C5	C26104	Capacitor, Cer, 0.1 uf, 50V
C7-C9	C26104	Capacitor, Cer, 0.1 uf, 50V
C10	C02103	Capacitor, Cer, 0.01 uf, 50V
C12	C02103	Capacitor, Cer, 0.01 uf, 50V
C14	C26104	Capacitor, Cer, 0.1 uf, 50V
C16	C26104	Capacitor, Cer, 0.1 uf, 50V
C17	C26104	Capacitor, Cer, 0.1 uf, 50V
C18	C09010	Capacitor, Elec, 1.0 uf, 50V
C19	C26104	Capacitor, Cer, 0.1 uf, 50V
C21	C26104	Capacitor, Cer, 0.1 uf, 50V
C23	C26104	Capacitor, Cer, 0.1 uf, 50V
C24		Frequency Dependent
C25	C07101	Capacitor, Elec, 100 uf, 25V
C26	C26104	Capacitor, Cer, 0.1 uf, 50V
C27	C07220	Capacitor, Elec, 22 uf, 25V
C28	C26104	Capacitor, Cer, 0.1 uf, 50V
C29	C07220	Capacitor, Elec, 22 uf, 25V
C30	C05560	Capacitor, Mica, 56 pf, 500V
C31	C05820	Capacitor, Mica, 82 pf, 500V
C32	C07101	Capacitor, Elec, 100 uf, 25V
C33, 34	C26104	Capacitor, Cer, 0.1 uf, 50V
C35		Frequency Dependent
C36	C00040	Cer Disc Trimmer 4-20 pf 160 VDC
C37	C07220	Capacitor, Elec, 22 uf, 25V
C38		Frequency Dependent
C39	C07220	Capacitor, Elec, 22 uf, 25V
C40	C26104	Capacitor, Cer, 0.1 uf, 50V
C41, 42		Frequency Dependent
C43-46	C26104	Capacitor, Cer, 0.1 uf, 50V
C47-49		Frequency Dependent
C50	C09010	Capacitor, Elec, 1.0 uf, 50V
C51, 52	C26104	Capacitor, Cer, 0.1 uf, 50V
C53	C02103	Capacitor, Cer, 0.01 uf, 50V
C54, 55	C05201	Capacitor, Mica, 200 pf, 500V
C56-62	C26104	Capacitor, Cer, 0.1 uf, 50V
CR1-2	CR04148	Diode, 1N4148
CR3	CR00209	Varicap, MV209
CR5	CR00277	Diode, 1N277
CR6-8, 10	CR04148	Diode, 1N4148
CR9	CR05059	Diode, IN5059
CR10A	R01000	Jumper
DS1	DS00484	LED, Nat'1 XC-484 Red
W9-10	J03103	Stripline Connector 1 x 3
J9-10	P03101	Jumper 2-position
W5-6	J03103	Stripline Connector 1 x 3
J5-6	P03101	Jumper 2-position
L1	L02270	Inductor, 27 uH
L2	L02101	Inductor, 100 uH
L3	L04100	Inductor Pot Core 400 uH
L4	L03102	Inductor, 1000 uH
L5, L6		Frequency Dependent

REF.DESIG	PART NO.	DESCRIPTION
Q1	Q03563	Transistor, 2N3563
Q2, Q3	Q04258	Transistor, 2N4258
Q4	Q03563	Transistor, 2N3563
Q5	Q00030	Transistor, TIP 30
R1	R01332	Resistor, 1/4w, 5%, 3.3K
R2	R01183	Resistor, 1/4w, 5%, 18K
R4	R01272	Resistor, 1/4w, 5%, 2.7K
R5,6	R01103	Resistor, 1/4w, 5%, 10K
R8	R01103	Resistor, 1/4w, 5%,
R9	R01273	Resistor, 1/4w, 5%, 27K
R10	R01123	Resistor, 1/4w, 5%, 12K
R11,12	R01332	Resistor, 1/4w, 5%, 3.3K
R13	R01473	Resistor, 1/4w, 5%, 47K
R14	R01182	Resistor, 1/4w, 5%, 1.8K
R15	R01475	Resistor, 1/4w, 5%, 4.7M
R16	R05102	Potentiometer, 1K
R17	R01682	Resistor, 1/4w, 5% 6.8K
R18	R01392	Resistor, 1/4w, 5%, 3.9K
R19	R21273	Resistor, 1/4w, 2%, 27K
R20	R21183	Resistor, 1/4w, 2%, 18K
R21,22	R01473	Resistor, 1/4w, 5%, 47K
R23	R01475	Resistor, 1/4w, 5%, 4.7M
R24	R01222	Resistor, 1/4w, 5%, 2.2K
R25	R01182	Resistor, 1/4w, 5%, 1.8K
R26	R01475	Resistor, 1/4w, 5%, 4.7M
R27	R01822	Resistor, 1/4w, 5%, 8.2K
R28	R01472	Resistor, 1/4w, 5%, 4.7K
R29	R01103	Resistor, 1/4w, 5%, 10K
R30-32	R01104	Resistor, 1/4w, 5%, 100K
R33	R01390	Resistor, 1/4w, 5%, 39
R34	R21183	Resistor, 1/4w, 2%, 18K
R35	R21823	Resistor, 1/4w, 2%, 82K
R36	R01153	Resistor, 1/4w, 5%, 15K
R37	R01474	Resistor, 1/4w, 5%, 470K
R38-40	R21183	Resistor, 1/4w, 2%, 18K
R41	R21204	Resistor, 1/4w, 2%, 200K
R42	R01105	Resistor, 1/4w, 5%, 1M
R43	R01103	Resistor, 1/4w, 5%, 10K
R44	R01100	Resistor, 1/4w, 5%, 10
R45	R01153	Resistor, 1/4w, 5%, 15K
R46	R01102	Resistor, 1/4w, 5%, 1K
R47	R01681	Resistor, 1/4w, 5%, 680
R48	R01103	Resistor, 1/4w, 5%, 10K
R49	R01152	Resistor, 1/4w, 5%, 1.5K
R50	R01104	Resistor, 1/4w, 5%, 100K
R51	R01474	Resistor, 1/4w, 5%, 470K
R52	R01473	Resistor, 1/4w, 5%, 47K
R53	R01222	Resistor, 1/4w, 5%, 2.2K
RP5-8	R36104	Resistor Pack 1.00K SIP

REF.DESIG	PART NO.	DESCRIPTION
U1	UHCU04	Integrated Ckt, 74HCU04
U3	U14515	Integrated Ckt, MC145151-1
U4	U4HC74	Integrated Ckt, 74HC74
U5	U4S140	Integrated Ckt, 74S140
U8	UO1014	Integrated Ckt, LT1014CN
U12	U78L05	Integrated Ckt, 78L05
U13	UO4193	Integrated Ckt, RC4193NB
U14	U78L12	Integrated Ckt, 78L12
U15	U4HC86	Integrated Ckt, 74HC86
U16	UHCU04	Integrated Ckt, 74HCU04
U17	U4HC74	Integrated Ckt, 74HC74
U18	UO555	Integrated Ckt, NE555
U19-21	UHC163	Integrated Ckt, 74HC163
U22	U4HC10	Integrated Ckt, 74HC10
U23-25	UHC163	Integrated Ckt, 74HC163
U26	U4HC10	Integrated Ckt, 74HC10

PARTS LIST FOR OPTION 40

REF. DESIG.	PART NO.	LOCATION
J2	J01027	Power Jack
T1	T00025	AC Adapter 9 VDC, 300 mA
CR10A	-	Not Used
W7	C26104	Capacitor, Cer, 0.1 uf, 50 V
W8	R01000	Jumper

PARTS LIST FOR OPTION 45

REF. DESIG.	PART NO.	LOCATION
C1	C26104	Capacitor, Cer. 0.1 uf, 50 V
CR1	CR05059	Diode, IN5059
J1	J02060	Header, 6 Pos. Rt. Angle
J2	J08009	Receptacle, 9 Pos.
R1	R01121	Resistor, 1/4 W, 5%, 120 ohm
R2	R01121	Resistor, 1/4 W, 5%, 120 ohm
U1	U6LS31	Integrated Circuit, AM26LS31

PARTS LIST FOR 3.579545 MHz

REF. DESIG.	PART NO.	LOCATION
JUMPERS	R01000	W2, W4, W7, W13, W17, W19
JUMPERS	P03101	W6, W9
J3	R01000	7-8, 9-10, 11-12 13-14
J4	R01000	1-2, 3-4, 5-6
J5	R01000	3-4, 7-8, 13-14, 17-18, 21-22, 23-24, 25-26, 27-28
J6	R01000	1-2

REF. DESIG.	PART NO.	DESCRIPTION
C24	C05271	Capiacitor, Mica, 270 pF, 500V
C35	C05150	Capacitor, Mica, 15 pF, 500V
C38	C05560	Capacitor, Mica, 56 pF, 500V
C41	C05301	Capacitor, Mica, 300 pF, 500V
C42	C05121	Capacitor, Mica, 120 pF, 500V
C47	C26104	Capacitor, Cer, 0.1 uF, 50V
C48	C05331	Capacitor, Mica, 330 pF, 500V
L5,6	L02120	Inductor, 12 uH
Y1	Y00040	Crystal, 14.318 MHz

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